

CLAIMS:

1. A method of controlling communication resources of a telecommunications system, the method including:

determining a performance measure characterizing performance of a communication channel between a first transceiver and a second transceiver, the communication channel including modulation, wherein modulation symbols are distributed using at least two radiation patterns, the performance measure being sensitive to the modulation; and  
controlling the communication resources based on the performance measure.

2. The method of claim 1, further including determining a plurality of performance measures for a plurality of communication channels between the first transceiver and the second transceiver; and

controlling the communication resources based on the performance measures.

3. The method of claim 1, further including determining a second performance measure for a second communication channel between the first transceiver and a third transceiver; and

controlling the communication resources based on the determined performance measures.

4. The method of claim 1, further including determining the performance measure by using a channel model which characterizes the communication channel between the first transceiver and the second transceiver.

5. The method of claim 1, further including determining the performance measure by using an extended channel model which contains at least partly a structure of a modulation matrix.

6. The method of claim 5, wherein the modulation matrix includes at least one symbol which is transmitted using at least two antenna resources within at least two symbol time intervals.

7. The method of claim 5, wherein the modulation matrix includes at least one element in a group including: one row for forming a vector modulation, a plurality of rows for forming matrix modulation, a symbol rate greater than one, a row having a dimension greater than that of a channel matrix, a column having a dimension greater than that of the channel matrix, effect of spreading, effect of carrier, effect of waveform, and effect of channelization codes.

8. The method of claim 1, further including determining the performance measure using at least one element in a group including: channel information on a radio channel associated with the communication channel, antenna weights associated with the communication channel, and modulation information on the communication channel.

9. The method of claim 1, wherein the performance measure comprises at least one element selected from a group including: frame-error rate, bit-error rate, signal-to-noise ratio, signal-to-interference ratio, asymptotic efficiency, throughput, interference power, and noise power.

10. The method of claim 1, further comprising selecting a transmission method based on the performance measure.

11. The method of claim 1, wherein controlling the communication resources is based on comparison between a target value and the performance measure.

12. The method of claim 1, further including adapting the communication resources to instantaneous requirements based on the performance measure.

13. The method of claim 1, wherein the communication channel further includes at least one element in a group including: interleaving, spreading, carrier waveform, sub-carrier waveform, channel encoding, matrix modulation, vector modulation, MIMO modulation, space-time coding, space-frequency coding, space-code coding, beam forming, multi-beam forming, radio channel, channel decoding, detection, equalizing, RAKE reception, and filtering of a received signal.

14. The method of claim 1, wherein the communication resources include a transmit communication resource selected from a group including: a temporal transmit communication resource, a spectral transmit communication resource, an encoding resource, a spatial transmit communication resource, and transmit power.

15. The method of claim 1, wherein the communication resources include receive communication resources.

16. An arrangement for controlling communication resources of a telecommunications system, the arrangement including:

means for determining a performance measure characterizing performance of a communication channel between a first transceiver and a second transceiver, the communication channel including modulation, wherein modulation symbols are distributed using at least two radiation patterns, the performance measure being sensitive to the modulation; and  
means for controlling the communication resources based on the performance measure.

17. The arrangement of claim 16, further including means for determining a plurality of performance measures for a plurality of communication channels between the first transceiver and the second transceiver; and

means for controlling the communication resources based on the performance measures.

18. The arrangement of claim 16, further including means for determining a second performance measure for a second communication channel between the first transceiver and a third transceiver; and

means for controlling the communication resources based on the determined performance measures.

19. The arrangement of claim 16, further including means for determining the performance measure by using a channel model which characterizes the communication channel between the first transceiver and the second transceiver.

20. The arrangement of claim 16, wherein the means for determining the performance measure uses an extended channel model which contains at least partly a structure of a modulation matrix.

21. The arrangement of claim 20, wherein the modulation matrix includes at least one symbol which is transmitted using at least two antenna resources within at least two symbol time intervals.

22. The arrangement of claim 20, wherein the modulation matrix includes at least one element in a group including: one row for forming vector modulation, a plurality of rows for forming matrix modulation, a symbol rate greater than one, a row having a dimension greater than that of a channel matrix, a column with a dimension greater than that of a channel matrix,

effect of spreading, effect of carrier, effect of waveform, and effect of channelization codes.

23. The arrangement of claim 16, wherein the means for determining the performance measure uses at least one element in a group including: channel information on a radio channel associated with the communication channel, antenna weights associated with the communication channel, and modulation information on the communication channel.

24. The arrangement of claim 16, wherein means for determining the performance measure characterizes at least one element selected from a group including: frame-error rate of the communication channel, bit-error rate, signal-to-noise ratio, signal-to-interference ratio, asymptotic efficiency, throughput, interference power, and noise power.

25. The arrangement of claim 16, further including means for selecting a transmission method based on the performance measure.

26. The arrangement of claim 16, wherein the means for controlling communication resources is based on comparison of a target value and the performance measure.

27. The arrangement of claim 16, further including means for adapting the communication resources to instantaneous requirements based on the performance measure.

28. The arrangement of claim 16, wherein the communication channel further includes at least one element in a group including: interleaving, spreading, carrier waveform, sub-carrier waveform, channel encoding, matrix modulation, vector modulation, MIMO modulation, space-time coding, space-frequency coding, space-code coding, beam forming,

multi-beam forming, radio channel, channel decoding, detection, equalizing, RAKE reception, and filtering of received signal.

29. The arrangement of claim 16, wherein the communication resources include a transmit communication resource selected from a group including: a temporal transmit communication resource, a spectral transmit communication resource, an encoding resource, a spatial transmit communication resource, and transmit power.

30. The arrangement of claim 16, wherein the communication resources include receive communication resources.

31. A controller of a telecommunications system, the controller including: a performance measure estimator for determining a performance measure that characterizes performance of a communication channel between a first transceiver and a second transceiver, the communication channel including:

modulation, wherein modulation symbols are distributed using at least two radiation patterns, and wherein the performance measure is sensitive to the modulation; and

a control unit connected to the performance measurement unit, the control unit for controlling the communication resources based on the performance measure.

32. The controller of claim 31, wherein the performance measure estimator is configured to determine a plurality of performance measures for a plurality of communication channels between the first transceiver and the second transceiver; and

wherein the control unit is configured to control the communication resources based the performance measures.

33. The controller of claim 31, wherein the performance measure estimator is configured to determine a second performance measure for a second communication channel between the first transceiver and a third transceiver; and

wherein the control unit is configured to control the communication resources based on the determined performance measures.

34. The controller of claim 31, wherein the performance measure estimator is configured to determine the performance measure by using a channel model which characterizes the communication channel.

35. The controller of claim 31, wherein the performance measure estimator is configured to determine the performance measure by using an extended channel model which contains at least partly a structure of a modulation matrix.

36. The controller of claim 35, wherein the modulation matrix includes at least one symbol which is transmitted using at least two antenna resources within at least two symbol time intervals.

37. The controller of claim 35, wherein the modulation matrix includes at least one element in a group including:

one row for forming a vector modulation, a plurality of rows for forming a matrix modulation, a symbol rate greater than one, a row having a dimension greater than that of a channel matrix, a column having a dimension greater than that of the channel matrix, effect of spreading, effect of carrier, effect of waveform, and effect of channelization codes.

38. The controller of claim 31, wherein the performance measure estimator is configured to determine the performance measure using at least one element in a group including:

channel information on a radio channel associated with the communication channel;

antenna weights associated with the communication channel; and  
modulation information on the communication channel.

39. The controller of claim 31, wherein the performance measure characterizes at least one element selected from a group including: frame-error rate of the communication channel, bit-error rate, signal-to-noise ratio, and signal-to-interference ratio.

40. The controller of claim 31, wherein the control unit is configured to select a transmission method based on the performance measure.

41. The controller of claim 31, wherein the control unit is configured to control communication resources based on comparison between a target value and the performance measure.

42. The controller of claim 31, wherein the control unit is configured to adapt the communication resources to instantaneous requirements based on the performance measure.

43. The controller of claim 31, wherein the communication channel further includes at least one element in a group including: interleaving, spreading, carrier waveform, sub-carrier waveform, channel encoding, matrix modulation, vector modulation, MIMO modulation, space-time coding, space-frequency coding, space-code coding, beam forming, multi-beam forming, radio channel, channel decoding, detection, equalizing, RAKE reception, and filtering of a received signal.

44. The controller of claim 31, wherein the communication resources include a transmit communication resource selected from a group



including: a temporal transmit communication resource, a spectral transmit communication resource, an encoding resource, a spatial transmit communication resource, and transmit power.

45. The controller of claim 31, wherein the communication resources include receive communication resources.